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Beware of the Red List – Top Materials to Avoid in Your Home



By [Gemma Alexander](#)

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[building materials](#), [green building](#), [Red List](#)



“The Red List” might sound like something from the Cold War. But the Red List has nothing to do with politics, and everything to do with chemistry. The Red List is actually a list of “worst in class” materials, chemicals, and elements the green building industry [tries to avoid](#). And even if you are not a construction professional, knowing about these materials and which products are made from them can help you make your home and your home improvement projects safer and more sustainable.

What Do You Think?



Are you considering moving because of climate change?

- No
- Yes
- I'm researching my options to decide

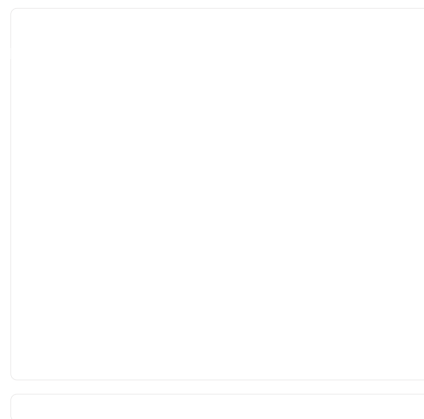
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The Red List

The Red List is generated by the [International Living Future Institute](#) as a part of the Living Building Challenge, a certification system that requires buildings to achieve net positivity for energy, water, and waste. Updated annually, the [LBC Red List](#) encourages builders to avoid the worst materials and chemicals used in construction. Eliminating all of them completely from home construction may not even be possible at this time. But the list provides a target for improvement. For homeowners, the list can inform [remodeling projects](#) and help guide you to safer household products. Learn more with this simplified version of the Red List.



Asbestos

[Asbestos](#) is a mineral that has been used in thousands of products, especially from the 1930s to the 1970s, most famously in popcorn ceilings. The U.S. banned asbestos in 1991, but the ban was overturned and it can still be [found in products](#) from [insulation](#) to vinyl tiles. The [tiny fibers](#) of asbestos can easily be inhaled and cause mesothelioma and other diseases. Protective equipment is required when working around asbestos. It should be disposed of as [hazardous waste](#).

Cadmium

Cadmium is a heavy metal [associated](#) with flu-like symptoms from acute exposure and cancer, kidney, bone, and lung disease from chronic exposure. Nevertheless, cadmium can be found in [cookware](#), [home electronics](#), and of course [batteries](#). Cadmium is also used in [pigments](#) that can lead to exposure through chipping paint or paint dust created during construction.

Chlorinated Polyethylene & Chlorosulfonated Polyethylene

Chlorinated polyethylene (CPE) is an inexpensive variation of polyethylene plastic, but with a chlorine content of roughly one-third. Like regular polyethylene, it is [versatile](#), used for wire and cable jacketing, roofing, hoses and tubing, and more.

Chlorosulfonated polyethylene (CSPE) is the base polymer for synthetic rubbers. Sold under the brand name [Hypalon](#) it was commonly used for the insulation of wire and cable jacketing. It was discontinued in 2009 due to production safety issues, lead content, and the highly toxic fumes it releases when burned.

CPE and CSPE are persistent organic pollutant source materials

and contribute to the creation of [dioxins and furans](#) at different points in their life cycle.

Chlorofluorocarbons (CFCs)

Although CFCs were banned in 1987, the hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs) that replaced them are [still in use](#) in aerosols, refrigerators, and air conditioners. HFCs are not as bad for the [ozone layer](#) as CFCs, but both long-lived groups of chemicals are still powerful greenhouse gases. Other countries have agreed to [phase out](#) HFCs.

Chloroprene

[Chloroprene](#) is used to make neoprene, the material best known for its use in wetsuits and fishing waders, but it's [also used](#) to waterproof roofing and to seal windows. While neoprene is chemically inert, chloroprene is a carcinogen that can be inhaled and can enter the body through the skin. It is a persistent organic pollutant source material that contributes to the creation of dioxins and furans at different points in its life cycle, such as its manufacture in Louisiana's [cancer alley](#).



Familiarity with the LBC Red List can help you ensure that your remodeling project is safer and more sustainable.

Formaldehyde

[Formaldehyde](#) is a [VOC](#) and known human carcinogen associated with nasal cancers and leukemia. It also acts as an asthma trigger and skin irritant. It can be found in [insulation](#) and manufactured [building products](#) like composite countertops, particleboard, and laminates. It's also in household products like [mattresses](#) and upholstery, as well as glues, paints, caulks, and more.

Halogenated Flame Retardants

Halogenated fire retardants (HFRs) are persistent, bioaccumulative toxins with adverse effects on neurological development and reproduction. They can cause thyroid hormone disruption and possible liver toxicity. When burnt, they release dioxins and furans. They can be found in insulation, foam, electronics, and upholstery — including in children's [car seats](#). While certain HFRs are [banned](#), in some cases, they may be necessary to meet legal fire safety standards.

Lead

In the past, lead was added to gasoline and to paint, which can [still be present](#) in older homes. Homes built before 1986 are more likely to have lead pipes, fixtures, and solder, which can enter drinking water. A toxic heavy metal, lead exposure damages every organ and system in the human body, especially the brain and central nervous system. Impacts are most profound for the young.

Mercury

Yet another highly toxic heavy metal, mercury is a bioaccumulative substance that [harms](#) the nervous, digestive, and immune systems, and can even cause death at frighteningly low levels of exposure. Nevertheless, it can still be found in [household items](#) from lightbulbs to thermostats that must be disposed of carefully to [avoid spills](#).

Phthalates

Phthalates are nearly ubiquitous in the U.S. population, with the highest concentrations in children aged 6–11 and in women. The National Research Council has [urged the EPA](#) to pursue a “cumulative risk assessment” of these chemicals, which have carcinogenic and hormone-disrupting potential. [In construction](#), phthalates are primarily used to make PVC or vinyl more flexible, pliant, and durable for use in roofing, adhesives and sealants, flooring, and wall coverings.

Polyvinyl Chloride (PVC)

Vinyl chloride, a building block of PVC and other chlorinated polymers, is a known [human carcinogen](#). PVC is a persistent organic pollutant source material that often contains other Red

List ingredients such as heavy metals and phthalates. Its manufacture and disposal can result in the production of bioaccumulative dioxins. Best known as a material for siding, PVC is the [most-used plastic](#) for building products. It can be found in pipes and fittings, flooring, window and door profiles, and roof membranes.

Wood Treatments Containing Creosote, Arsenic, or Pentachlorophenol

The traits that make conventional wood treatments effective against rot and insect damage also make them toxic. Studies associate creosote exposure with certain cancers in humans, and liver, kidney, and gestational problems in laboratory animals. Inorganic arsenic is not only an acute toxin; it is a known human carcinogen. Studies link pentachlorophenol to liver and immune system damage in humans, and reproductive and thyroid damage in laboratory animals. Treated lumber is [used most often](#) in outdoor projects, but can be used wherever wood could get wet, such as when posts are buried in the ground.

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By [Gemma Alexander](#)

Gemma Alexander has an M.S. in urban horticulture and a backyard filled with native plants. After working in a genetics laboratory and at a landfill, she now writes about the environment, the arts and family. See more of her writing [here](#).

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